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PATENT SPECIFICATION



Application Date: Aug. 3, 1927. No. 20,485/27.

282,305

Complete Accepted: Dec. 22, 1927.

COMPLETE SPECIFICATION.

Improvements in and relating to Toys.

I, WILLIAM EVANS COLWELL, of Route No. 1, Zion, in the County of Lake and State of Illinois, United States of America, a subject of the King of Great Britain, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

10 This invention relates to certain novel improvements in walking toys.

The object of the invention is to provide a toy with an improved spring or motor operated mechanism and with leg portions so mounted on the toy that said mechanism can move said leg portions in a manner similar to walking.

20 Another object of the invention is to provide improved means whereby the operation of the mechanism can be expeditiously controlled.

25 It has heretofore been proposed to provide a toy in which leg portions are mounted upon a body and are adapted to be driven, in an upward and downward, forward and backward direction, by a spring motor also mounted within the body, the driving means including a set of crank-arms or cam mechanism engaging in slots in the leg portions, a brake or control, in some instances, being provided for the purpose of stopping the toy when desired or for controlling the operation of the spring.

35 Now according to the present invention the improved toy comprises a body portion on which leg members are movably attached, a spring or motor operated mechanism for actuating the leg members
40 by means of crank-arms, a ratchet wheel included in the mechanism, a pawl which is pivotally mounted upon the body portion and is adapted to engage the ratchet wheel and stop the mechanism when
45 desired, and a governing device adapted

to control the speed of operation of the mechanism and mounted within the body portion.

The invention will be best understood by reference to the accompanying drawings, showing the preferred form of construction and in which:—

Figure 1 is a side elevational view of a doll embodying one form of my invention;

Figure 2 is a front view of the doll shown in Figure 1, certain parts being in elevation and certain parts being in section.

Figure 3 is a detail view taken substantially in the plane of the line 3—3 of Figure 2;

Figure 4 is a detail view of the governor mechanism employed in the device; and

Figure 5 is a side elevational view of a toy horse embodying a form of construction of my apparatus.

Referring to the drawings, wherein the preferred embodiment of my invention is illustrated, it may be seen that I provide a doll embodying a body portion 10 to which arm members 11 and 12 are pivotally attached. A shaft such as 13 is journaled in the body portion of the doll and embodies head portions 14¹ and 15¹ which serve to aid in retaining the leg members 14 and 15 in position, said leg members embodying slots 16 and 17 through which said shaft 13 extends. In the leg members below the slots 16 and 17 are slots 18 and 19. As will be made apparent presently, the length of these slots will determine the stride and therefore the length and height thereof may be varied by altering the length of the slots.

Rotatably journaled in the body portion 10 of the doll is a shaft 20 and unitary therewith and located extraneous of said body portion are cranks 21 and 22. If

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desired, one of these cranks may be fore shortened to cause the toy to travel in a circle. The cranks 21 and 22 are arranged so that they are disposed in opposite directions on the opposed sides of the body portion 10 and if desired the cranks may be formed of two or more sections. A recess 23 is provided in the body portion 10 and the shafts 13 and 20 are adapted to extend therethrough. A shaft 24 is journaled in the body portion 10 and extends through the recess 23. Mounted on the shaft 24 is a gear wheel 25. Juxtaposed the gear wheel 25 and mounted around the shaft 24 is a spring 26, one end of which is rigidly secured to the shaft 24 and the other end of which is rigidly secured to the body portion 10 interiorly of the recess 23, as at 27 (Figure 3). Adapted to mesh with the gear wheel 25 is a pinion 28 which is keyed to the shaft 20 and connected to this pinion is a gear wheel 29 which is also mounted on the shaft 20. The gear wheel 29 meshes with a pinion 30 (Figure 3) that is keyed to the shaft 31 and connected to this pinion so as to receive motion therefrom is a gear wheel 32 which meshes with the pinion 33 that is keyed to the shaft 34. Securely keyed to the shaft 34 is a ratchet wheel 35 (Figure 2), the purpose of which will be brought forth presently. Mounted on the shaft 24 in juxtaposition to the gear wheel 25 is a ratchet wheel 36. A spring urged pawl 37 is carried by the gear wheel 25 and engages the ratchet wheel 36 in such a way that it prevents unwinding of the spring 26 as said spring is being wound and which also serves to rotate said gear wheel as the spring is being unwound during operation. The spring 26 is wound by means of a key member that is caused to engage an arrangement on one end of the shaft 24. As stated, the pawl and ratchet wheel construction 37 and 36 serves to prevent the spring unwinding at undesired times. Arranged so as to engage the ratchet wheel 35 is a pawl 39 which is pivotally mounted at 40 and which has a portion to which the spring 41 is attached which serves to hold the pawl 39 in engagement with the ratchet wheel 35.

When the pawl 39 is withdrawn from engagement with the ratchet wheel 35, the spring 26, which has been previously wound up, rotates the shaft 24 and therefore the ratchet wheel 36. Inasmuch as the pawl 37 connects the gear wheel 25 to the ratchet wheel 36, this gear wheel will also rotate. The movement of the gear wheel 25 is transmitted to the shaft 20 through the pinion 28 which operates the cranks 21 and 22 which

causes the movement of the leg members, this action being brought out more clearly hereinafter. Rotation of the shaft 20 is transmitted to the shaft 31 (Figure 3) through the gear wheel 29 and the pinion 30 (Figure 3) this rotation in turn being transmitted to the shaft 34 through the gear wheel 32 and the pinion 33. When the device is operated for a desired length of time, the pawl 39 is released from disengaging position and is caused to engage the ratchet wheel 35 by the spring 41.

A governing device adapted to control the speed of operation of the mechanism is mounted at one end of the shaft 34. Secured to one wall of the recess 23 (Figure 2) is a circular drum 42 which is disposed equidistantly around the shaft 34 (Figure 4). In the portion of the shaft 34 within the housing 42, a hole 43 is provided. Extending through the hole 43 is a stem 44 on one end of which a shoe 45 is mounted. At the opposite end of the stem 44 a series of screw threads are provided and in engagement with these threads is a nut 46. By arranging the position of the nut 46 the degree of frictional engagement between the shoe 45 and the drum 42 may be varied, and thus the speed of operation may be controlled. A washer 47 is disposed on the inner side of the nut 46 and a helical spring 48 is disposed around the stem 44 and extends between the washer 47 and the shaft 34. The mass of the shoe 45 is such that when sufficient rotational velocity is imparted to the shaft 34 the shoe 45 will contact with the inner surface of the drum 42 and thus produce a friction drag which will regulate the speed of operation.

In the embodiment of the invention illustrated in Figures 1 to 3 inclusive the pawl 39 is arranged so that it embodies a projection 49 which extends beyond the point at which the spring 41 is secured to the pawl. Attached to the projection 49 is an operating member 50 which in this instance extends up through the body portion 10 and protrudes through the wall thereof so as to be secured to the arm member 11 as at 51.

The doll is positioned in the manner shown in Figure 1 and the arm member 11 is raised so as to withdraw the pawl 39 from engagement with the ratchet wheel 35, the spring 26 having been previously wound. As soon as the pawl 39 is withdrawn from the ratchet wheel 35 the spring 26 begins to unwind and the unwinding movement thereof is transmitted to the shaft 20 through the system of gear wheels heretofore described. As stated, the cranks 21 and 22 are oppositely

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disposed and have portions which extend through the slots 18 and 19 in the leg members 14 and 15. Further, the leg members are guided by a shaft 13 which extends through slots 16 and 17 provided in said leg members. Therefore, as the cranks 21 and 22 revolve they will reciprocate in the slots 18 and 19 and will cause the leg members to rock about the shaft 13 as they move up and down; this movement being permitted by the slots 16 and 17. This movement will cause the leg members to move in a manner very similar to the movement of the legs of a human being and will therefore cause the doll to walk. Upon releasing the arm 11, the spring 41 will cause the pawl 39 to engage the ratchet wheel 35 and thus arrest movement of the mechanisms.

In Figure 5 the mechanisms are shown as applied to a horse and it is to be understood that a similar construction will be provided in order to cause the walking of any four legged animal. The driving mechanism illustrated best in Figure 3 is applied to the front leg members of such a toy. In this instance the spring urged pawl 39 (Figure 5) is controlled by a bell crank arrangement such as 52 which is pivoted at 53. The bell crank 52 embodies a short arm 54 and a long arm 55 which protrudes through a suitable opening provided in the body portion of the toy. When the bell crank 52 is moved forwardly so as to dispose the arm 54 in a vertical plane the pawl 39 is withdrawn from engagement with the ratchet wheel 35 and since the arm 54 is vertically disposed the spring holds the rear or right-hand end of the pawl, to which it is attached, down against this arm 54 and since the movement will be in a straight line said spring will be arrested from causing engagement between the forward end of the pawl 39 and the ratchet wheel 35. However, as soon as the bell crank 52 is moved into the position depicted in Figure 5, the spring will force the right-handed end of the pawl 39 downwardly so as to move its forward end into engagement with the ratchet wheel 35 and arrest movement of the device.

In four legged toys, it is of course necessary to operate the rear legs as well as the front ones and therefore a sprocket wheel 56 is mounted on the crank shaft 20. A shaft 20' is journaled in the body portion 10 in the region of the rear legs and embodies cranks 21' and 22' which extend through slots 18' and 19' provided in the leg members 14a and 15a. In this embodiment, the leg members are arranged so that when the rear leg on

one side is in contact with the floor the front leg on the other side will be in contact with the floor or more specifically, when the leg 15a is in the lowermost position the leg 14 will also be in this position and the legs 14a and 15 will be in their forwardmost position. This construction permits four-legged toys to be operated in a more natural manner and provides a self supporting movement. The toy is supported by the legs which are in engagement with the floor, which are in turn partially supported by the cranks driving these legs. As the cranks revolve they engage the lower end of the slot in which they are respectively mounted and during the time that the crank portion is below the horizontal, this engagement between the lower end of the slot and the crank will assist in supporting the toy.

Mounted on the shaft 20' in alignment with the sprocket wheel 56 is a sprocket wheel 57 and a suitable chain 58 connects these two wheels so as to transmit the movement of the shaft 20 to the shaft 20'. A suitable tensioning device 59 is provided in engagement with the chain 58.

When the arm 54 of the bell crank 52 is moved into vertical position so as to withdraw the pawl 39 from the ratchet wheel 35 the spring 26, said spring having been wound tight, starts to unwind and transmits movement through the system of gear wheels previously described, to the shaft 20 and thus operates the cranks 21 and 22 in the manner described so as to impart a walking movement to the front legs. This movement is translated through the sprocket wheels 56 and 57 and the chain 58 to the shaft 20' which operates the cranks 21' and 22' in a manner similar to the cranks 21 and 22 but differently disposed, thus imparting a walking movement to the rear legs and since said legs are disposed in the manner described, the toy animal will move with a movement similar to the walking of the animal represented by the toy.

It is apparent from the foregoing description that I have provided a compact and simple arrangement whereby the walking movement may be imparted to animated toys. Further I have provided means for imparting movement to the device which may be controlled very expeditiously in the case of dolls and legged toys.

If desired the feet of the leg members 14 and 15 may be broadened as indicated by dotted lines 14b in Figure 2 for the purpose of further steadying the operations of the toy during the contact of

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each leg member with the floor or ground and to prevent it toppling over.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A walking toy, comprising a body portion on which leg members are movably attached, a spring or motor operated mechanism for actuating the leg members by means of crank-arms, a ratchet wheel included in the mechanism, a pawl which is pivotally mounted upon the body portion and is adapted to engage the ratchet wheel and stop the mechanism when desired, and a governing device adapted to control the speed of operation of the mechanism and mounted within the body portion.

2. In a walking toy as claimed above, the attachment of an operating member to the pawl, which is connected to a movable arm or other member of the toy and is so disposed that, when the arm or other member is raised or moved forwardly, the operating member will withdraw the pawl from its ratchet wheel

and the toy will walk, and vice versa.

3. In a walking toy as claimed in Claim 1, the provision of a chain or other member engaging sprocket or other wheel-mounted on the body portion adjacent to the legs of an animal and a tensioning device furnished for engagement with the chain or other member, for the purpose described.

4. In a walking toy as claimed in Claim 1, the provision of a bell-crank or handle on the pawl for co-operation therewith in the manner described.

5. In a walking toy as claimed in Claim 1, a governing device constructed and adapted to operate substantially as described with reference to Figure 4.

6. The improved walking toys constructed and adapted to operate substantially as described with reference to Figures 1 to 4, or to Figures 4 and 5, of the accompanying drawings.

Dated this 3rd day of August, 1927.

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Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1927.

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